

REMARKS

The Office Action rejected the claims 1 through 7 as being unpatentable over Viste, in view of Kobayashi ('998) Motomiya, Zebelean, Peterson and Taiwan Patent Nos. 055904 and 391359.

In reply, the Applicant points out the features of the present invention as recited in currently amended claim 3: "which comprises the step of adjusting a thickness of said metal shells by subjecting the inner surface thereof to blasting process so as to form at least a partial portion of the inner surface of at least one of said metal shells to a different thickness than a remainder thereof;" in claim 6, "said head is formed by combining a face shell, a crown shell, a sole shell and a peripheral side shell"; in claim 7, "said sole shell is formed integrally with said peripheral side shell"; in the newly added claim 8, "by subjecting an inner surface of each of said shells to a blasting process, a central portion of said face shell is formed thicker than a peripheral portion thereof, while a peripheral side portion of said crown shell is formed thicker than that of a center portion thereof, and said sole shell is formed thicker than that of the peripheral side shell"; Claim 3 has been amended, while the original claims 1, 2, 4, 5 have been canceled and the claim 8 has been newly added.

According to the claims 3, 6, 7, 8, a new technical idea is presented such that a blasting process is utilized for adjusting the thickness and weight of each of the separate shells while it has heretofore been used conventionally only for cleaning, forming marks or fine irregularities or the like in order to improve external appearances.

Further, according to the above structures, since thickness of each of the separate shells is adjusted by grinding the inner surfaces of the separate shells using a blasting process, each of the separate shells can be reduced in weight and therefore the reduction in weight can be distributed freely, so that a position of the center of gravity can be easily adjusted and then a larger-sized head can be provided. Furthermore, the blasting process is excellent in uniformity in manufactured shapes, realizing cost reduction and securing strength as compared to chemical process. In addition, not only a position of the center of gravity but a position of the moment of inertia can be adjusted according to a portion to be ground. Moreover, at least a part of the separate shell in an identical surface thereof is formed to a different thickness from that of the remaining parts, so that, for example in an identical surface of a face portion, a thickness can be adjusted to reduce weight thereof and further the weight can be precisely distributed, thus allowing the freedom of design to be improved.

With regard to the amended items "thickness of each of said separate shells is adjusted by subjecting an inner surface of each of said separate shells to a blasting process, while at

least a part of each of the separate shells is formed to a different thickness than that of the remainder thereof by a blasting process" and "by subjecting an inner surface of each of said shells to a blasting process, a central portion of said face shell is formed thicker than a peripheral portion thereof, a peripheral portion of said crown shell is formed thicker than that of a center portion thereof, and said sole shell and a sole shell of the peripheral side shell are formed thicker than that of the peripheral side shell", these items are mainly based on the following description written in 16 to 27 lines of the page 5 in the original specification:

"Through the foregoing grinding process, the face shell 11 may be formed thicker in its center portion in such a manner that the thickness "A" of the center portion of the face shell 11 is formed as thick as 2.6mm, while the thickness "a" of the ground peripheral portion surrounded by chain line in the drawing as thin as 1.8 mm. The crown shell 12 may be formed thicker in its peripheral portion such that the thickness "B" of the peripheral portion is formed as thick as 1.0 mm, while the thickness "b" of the ground center portion thereof which is surrounded by one-dotted chain line in the drawing is formed as thin as 0.8 mm. Further, the integrated sole shell 13 and peripheral side shell 14 may be formed such that the thickness C of the sole shell 13 may be formed as thick as 1.15 mm, while the thickness "c" of the ground peripheral side shell 14 surrounded by one-dotted chain line in the drawing is as thin as 0.8mm so that the thickness of the sole shell 13 may be formed thicker.

SUMMARY OF THE CITED REFERENCES

Viste discloses at least two separate shells (for a face portion and a crown portion) for forming a structure of a club head by their combination and further discloses a process for reducing thickness of an inner side metal shell. Kobayashi, Motomiya and Zeblean each disclose that technologies are conventional which assemble a hollow metal club head by using a plurality of shells sequentially or concurrently welded.

Peterson discloses that sand blasting and grinding for improving an external appearance of a head are commonly used.

The Taiwanese patent documents disclose blasting and grinding as a general process.

COMPARISON OF THE INVENTION TO THE CITED REFERENCES

Viste describes that an inside of a striking plate is processed by any one of hot or cold press, forging and a swaging process to obtain grooves. However, any of hot or cold press, forging and swaging process Viste described, is a compression molding process and therefore is different fundamentally as a processing principle from a grinding process of the present

invention. Further, reduction in weight of a head cannot be achieved by the compression molding as no weight can be adjusted thereby.

Furthermore, as described in the patent publication, the grooves Viste discloses have the same cross-sectional shapes as those of score lines and then are formed in parallel with the score lines in an inner surface of a face shell so as to be positioned between grooves formed in an outer surface of the face shell, that is, the score lines. Consequently, the grooves do not serve as adjustment of a thickness of the face shell and so are merely formed without any significant purpose. On the contrary, in the present invention, each of the separate shells can be reduced in weight by adjusting a thickness of each of the separate shells such as the face shell or the like, so that the resulting reduction in weight is distributed freely, thus enabling adjustment of a position of the center of gravity. In the invention of Viste, no inventive concept like that of the present invention is disclosed or suggested at all. In the applications of Kobayashi, Motomiya and Zebelean, no description concerning applying the blasting process to an inside surface of a separate shell can be found and further no inventive concept for adjusting a thickness of a separate shell is disclosed or suggested.

As for Peterson, he discloses usage of sand blasting for improving an external appearance of a head. However, no concept of applying blasting to an inner surface of a separate shell for adjusting a thickness thereof is also disclosed and suggested.

Whereas the patents of Taiwan disclose blasting as a general grinding process, the disclosure is limited within patterning and engraving and so no adjustment process of a thickness of a part is disclosed and suggested, entirely.

After all, the present invention has such advantages over the above-cited references as follows: since thickness of each of the separate shells is adjusted by grinding the inner surfaces of the separate shells using a blasting process, each of the separate shells can be reduced in weight and therefore the reduction in weight can be distributed freely, so that a position of the center of gravity can be easily adjusted and then a larger-sized head can be provided. Furthermore, the blasting process is excellent in providing uniformity of manufactured shapes, realizing cost reduction and securing strength as compared to chemical process. Besides, not only a position of the center of gravity but the moment of inertia can be adjusted according to a portion to be ground. Moreover, at least a part of the separate shell in an identical surface thereof is formed to a different thickness from those of the remaining parts, so that, for example in an identical surface of a face portion, thickness can be adjusted to reduce weight thereof and besides the weight can be precisely distributed, thus allowing the freedom of design to be improved.

Consequently, the particular behavior and advantages of the present invention cannot be easily derived from each of the cited references, which contain neither concept of adjusting thickness of each of the separate shells by grinding the inner surface of each of the

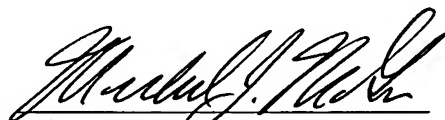
separate shells using blasting nor idea of forming at least a part of each of the separate shells in an identical surface thereof to a different thickness from those of the remaining parts.

CONCLUSION

In view of the Amendment and Remarks, reconsideration of the patent application is respectfully requested. Claims 3, 6, 7 and 8 are still pending and a Notice of Allowance for these claims is respectfully requested.

Respectfully submitted,

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